

## To find out the risk factors associated with cataract development in tertiary care hospital Saudi, Riyadh – A case control study

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### **ABSTRACT:**

**Objective:** The purpose of this study is to identify and analyze the risk variables linked to the development of cataracts in a Saudi Arabia tertiary care facility. By using a case-control approach, the study aimed to identify important correlations between different factors and the incidence of cataracts, which will provide important information for focused interventions and preventive actions in the community. **Method:** Direct interviews were used to gather demographic and vulnerability data using a pre-tested structured questionnaire. Important risk factors for the development of cataracts were estimated, including smoking, diabetes, hypertension, glaucoma, trauma, myopia, and intraocular inflammation. **Result:** The findings indicate that individuals with diabetes had a twofold increased risk (odds ratio 2.04), which is corroborated by a significant p-value (0.0009) and a tight 95% confidence interval (0.68-6.11). The results indicated that glaucoma was a significant risk factor (odds ratio 10.36), with a notable confidence range (2.74-39.18) and a p-value of 0.000. A significant p-value of 0.010 indicated a small increase in risk for hypertension, with an odds ratio of 1.08. The odds ratio for myopia was 2.73, which indicates a higher risk; however, a greater confidence interval (0.30-9.89) and a p-value of 0.005 indicate some variability. **Conclusion:** The research endeavor's outcomes will enhance comprehension of the inception of cataracts in the local populace, offering crucial perspectives for healthcare practitioners and policymakers to execute focused preventive measures and treatments.

**Keywords:** Risk factors, Cataract development, Tertiary care hospital, Saudi, Riyadh

### **INTRODUCTION:**

Cataract, a common eye disorder characterized by lens clouding, is a primary cause of visual impairment on a global scale. Cataracts contribute considerably to visual impairments globally, according to the World Health Organization (WHO), emphasizing the importance of identifying and addressing the associated risk factors. (1) Cataract prevalence is increasing, representing a growing public health problem. Global figures show a significant increase in cataract cases, with numbers increasing. (2) This growing trend underscores the importance of having a thorough grasp of the risk factors that are causing the increase in cataract incidence. Cataracts are caused by a variety of risk factors, including

demographic, lifestyle, and health-related variables. (3) Age is a key risk factor, with the aging process having an important part in cataract formation. Gender variations also play a role, with studies indicating that females are more susceptible. Furthermore, comorbidities including diabetes and hypertension, refractive problems, and socioeconomic status all contribute to the complicated terrain of cataract risk. Global and regional studies have shed light on the many risk factors connected with cataracts. In Sweden, for example, studies showed age 70, female gender, and myopia as risk factors for cataract development. These findings emphasize the significance of taking regional variations and demographic nuances into account when

attempting to comprehend the multifaceted nature of cataract risk.(4). These areas may have distinct risk factors that are impacted by genetic, environmental, and cultural variables. Understanding the individual risk factors prevalent in these places allows for the development of personalized preventative interventions to address the unique issues posed by cataracts in the MENA and UAE regions. Recent research in Saudi Arabia, provide localized insights into the risk variables related with cataract development. Comorbidities such as diabetic retinopathy, glaucoma, corneal opacities, and keratoconus were identified as important contributors to cataract incidence in a study conducted at a private hospital(5). This stresses the delicate link between systemic health issues and ocular illnesses, suggesting a comprehensive approach to cataract risk reduction. An advanced and region-specific strategy is required as we work to solve the worldwide challenge of cataracts. We can build targeted preventative strategies that take into account the distinct risk factors common in different places by integrating global knowledge with localized research. This collaborative and varied approach will help to improve public health measures, decreasing the impact of cataracts on individuals and communities globally. The rationale for this research originates from the need to understand the complex web of risk factors that contribute to the development of cataracts, a common eye ailment with rising global prevalence. This case-control study, which is being conducted at the Ophthalmology tertiary care facility of Dawadmi & Shaqra Region, Shaqra University in Riyadh, intends to provide localized insights into the particular risk factors prevalent in the Saudi Arabian population.

**METHOD:**

A case-control research was done at Ophthalmology tertiary care hospital, Dawadmi & Shaqra Region, Shaqra University, Riyadh between May and August 2022, with a sample size of 270 obtained using the WHO sample size calculator. Individuals with lens

opacity and visual impairment awaiting surgery were chosen among Ophthalmology clinic attendees, with post-operative patients excluded. Purposive sampling was used to choose 180 controls in a 1:2 ratio from relatives of patients with identical diagnostic criteria, omitting cataract cases. Age and gender, two confounding factors, were properly matched between cases and controls. The study received ethical approval from Dawadmi & Shaqra Region, Shaqra University ethical review board. The presence of consenting participants ensured a thorough and ethically sanctioned study approach. Participants in the study voluntarily provided information. After providing their informed consent, participants supplied data, guaranteeing confidentiality. Through direct interviews with the use of a standardized questionnaire, demographic information and other risk variables were acquired. When evaluating the risks of cataract formation, factors such as smoking, diabetes, hypertension, glaucoma, steroid use, analgesics, occupational sunlight exposure, early-life myopia, trauma, intraocular inflammation, social class, and education were taken into account. SPSS version 22 was used to analyze the gathered data and determine the frequencies and percentages for the categorical variables. In the analysis, cataract was considered the outcome variable. By using multiple logistic regression analysis, it was possible to determine which risk variables were significantly associated with the formation of cataracts, with a p-value of less than 0.05.

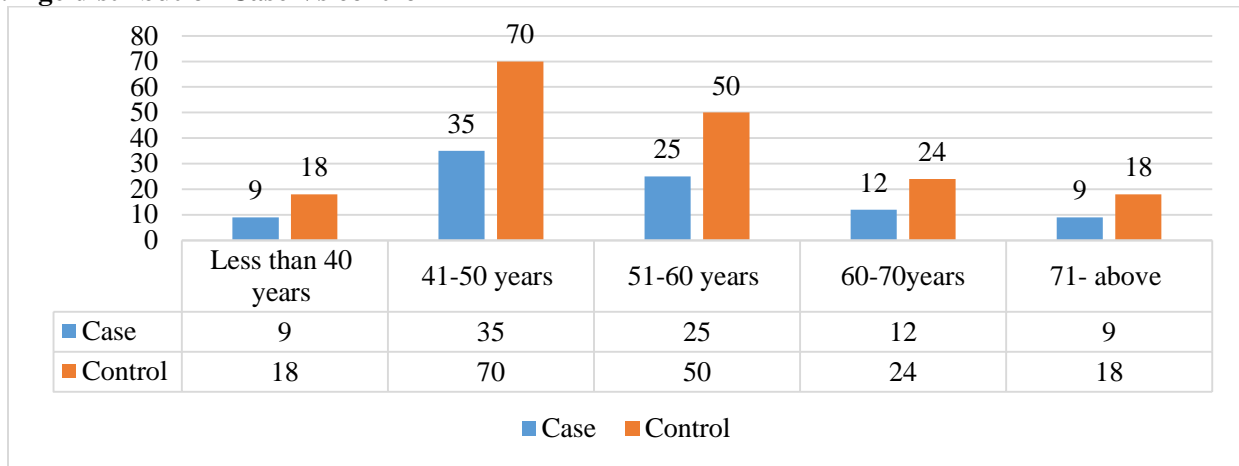
**RESULT:**

The table below compares the gender distributions of two groups: cases (n=90) and controls (n=180). In the case group of 90 people, 52.2% (47 people) are men, while 47.8% (43 people) are females. Similarly, of the 180 people in the control group, 52.2% (94 people) are men and 47.8% (86 people) are females. The use of percentages provides a more detailed picture of gender distribution within each group.

**Table 1: Gender distribution Case Vs control**

<b>Gender</b>	<b>Case (n=90)</b>	<b>Control (n=180)</b>
<b>Male</b>	47	94
<b>Female</b>	43	86

**Table 2: Age distribution Case Vs control**



The data presented highlights numerous key risk factors linked to a certain medical condition. Diabetes patients had an odds ratio of 2.04, indicating a twofold greater risk, which is supported by a narrow 95% confidence interval of 0.68 to 6.11 and a low p-value of 0.0009, highlighting statistical significance. Glaucoma emerges as a significant risk factor, with an odds ratio of 10.36 and a confidence interval spanning from 2.74 to 39.18, both of which contribute to a very significant p-value of 0.000. With an odds ratio of 1.08, hypertension is associated with a slight increase in risk, and while the

confidence range (0.80 - 1.46) contains 1, a p-value of 0.010 indicates statistical significance. Myopia had an odds ratio of 2.73, indicating an increased risk, while the larger confidence interval (0.30 - 9.89) and p-value of 0.005 indicate some variability. The odds ratios for dehydration crisis and a family history of cataract are 1.08 and 2.98, respectively, with confidence intervals and p-values supporting their substantial relationships. Notably, analgesics (NSAIDs) use is a strong risk factor, with an odds ratio of 5.19, a confidence range of 1.39 to 19.32, and a p-value of 0.001.

Risk factors	Odds ratio	95% confidence intervals	P-value
<b>Diabetes</b>	2.04	0.68 - 6.11	0.0009
<b>Glaucoma</b>	10.36	2.74-39.18	0.000
<b>Hypertension</b>	1.08	0.80 – 1.46	0.010
<b>Myopia</b>	2.73	0.30-9.89	0.005
<b>Dehydration crisis</b>	1.08	0.80-1.48	0.010
<b>Family history of cataract</b>	2.98	1.15-7.72	0.003
<b>Analgesics (NSAIDs)</b>	5.19	1.39-19.32	0.001

**DISCUSSION:**

The study's major goals are to evaluate factors linked with lens opacity and visual impairment at Dawadmi & Shaqra Region, Shaqra University's Ophthalmology tertiary care facility. The study, which has a sample size of 270 people selected by the WHO sample size calculator, attempts to uncover risk factors among Ophthalmology clinic patients awaiting surgery. Controls will be drawn from relatives who fit comparable diagnostic criteria and will be closely matched in age and gender. The study aims to provide useful insights into the understanding of lens opacity and visual impairment, filling information gaps and supporting better therapeutic management. Ethical approval ensures that stringent research standards are followed. A systematic review and meta-analysis

evaluated the regional and global prevalence of age-related cataract. The age-standardized prevalence of cataract (ASPPE) differed significantly across six geographical regions, with the highest rate (36.55%) in Southeast Asia and the lowest (9.08%) in the Americas. (6) A significant prevalence of cataract ranging from 9.0% to 36.5% was identified in a detailed study spanning two communities in Northern Pakistan with varying levels of UV light. This prevalence showed a distinct upward trend with increasing age, with a particularly notable and statistically significant increase in women. This multidimensional investigation, which was influenced by an exhaustive review of environmental elements, epidemiological patterns, and demographic characteristics, led to the critical conclusion that ultraviolet light exposure appears to be a

probable risk factor in the etiology of cataract formation. These findings highlight the complexities inherent in determining cataract prevalence, determining the influence of UV radiation, and identifying demographic differences in a variety of environmental scenarios.(7)A study conducted in rural and urban India discovered a considerable variation in cataract prevalence between the two groups increased age, higher HbA1c levels in the rural population, and overweight in the urban population were determined to be significant risk factors for cataract in the multivariate analysis(8) Cataracts are more likely to form in people with diabetes than in people who do not have the metabolic disorder. According to research, people with diabetes have a twofold increased risk of developing cataracts(9). Diabetes and cataracts have an intricate link due to a variety of variables, including the negative impact of high blood sugar levels on ocular blood vessels, resulting in reduced circulation and nutrition supply to the lens(10). Surprisingly, research suggests that diabetics under the age of 65 are three to four times more likely to get cataracts. Surprisingly, the risk of cataract formation related with diabetes is higher in younger people with this metabolic illness. Importantly, patients with diabetes who acquire cataracts may initially ignore symptoms because cataracts appear as foggy patches in the eyes.(11, 12)

A study on Assessment of knowledge regarding cataract among Saudi adult population in Makkah city, Saudi Arabia found that Saudis aged 40 and up have little understanding about cataract. As a result, efforts should be undertaken to raise the general public's knowledge and awareness of the disease(13). According to a different study on adult blindness and visual impairment, ecological and socioeconomic factors are important in determining the prevalence and underlying causes of blindness and visual impairment in the nation. Currently, there are significant data gaps that make it difficult to monitor and assess eye health. In order to address this, methods for dynamic monitoring and assessment should be made easier by integrating eye health indicators into the national health information system. This strategy will help provide a thorough understanding of the variables affecting blindness and visual impairment, paving the way for more potent preventative and intervention plans in Saudi Arabia.(14-16)

### **CONCLUSION:**

Based on risk estimation, the current study found that glaucoma, diabetes, myopia, dehydration crises, family history, and sun exposure are important risk factors for cataract formation. The research endeavor's outcomes will enhance comprehension of the creation of cataracts in the local populace, offering crucial perspectives for healthcare practitioners and policymakers to execute focused preventive measures and treatments.

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### **STATEMENT OF ETHICS:**

This study protocol wa.

### **CONSENT TO PARTICIPATE STATEMENT:**

This study has been granted an exemption from requiring written informed consent by of Research Ethics in Shaqra University as it is a questionnaires-based study.

### **CONFLICTS OF INTEREST STATEMENT:**

The authors have no conflict of interest

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### **DATA AVAILABILITY STATEMENT:**

All data generated or analyzed during this study are included in this article. Further enquires can be directed to the corresponding authors.

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